

particularly if their concentrations vary with the completion of the reaction.

Because the concentration of the enzyme and substrate are kept constant throughout the investigations, the relative rates obtained with each variation may be plotted against pH.

To repeat the run at another pH the cell is emptied through F, a new setting of U is made, and the flow of solution is renewed.

Cineradiographic Circle Unit



The cineradiographic circle unit permits simultaneous recording of three parameters of mandibular movements for better understanding of the working role of the temporomandibular joint. The unit consists of two 7-foot disks standing on edge and fastened parallel to each other by 4-foot interconnecting shelves. The patient's chair is located between the disks that rotate on floor-mounted rubber bearings. This rotating unit supports and maintains the X-ray tube and the image intensifier-recording camera in proper alignment to each other on two opposing interconnecting shelves. Thus the cineradiographic equipment rotates around the patient who is seated in the center of the double circle system.

This feature provides a 120° choice of X-ray angulations that can be used without tilting the patient's head as is necessary in some current techniques that introduce a deviation from normal intermaxillary relationships.

Biplane data can also be recorded; as the primary motion picture camera records the output of the image intensifier, a secondary cine-camera records the facial movements of the patient as viewed through the open center section of the front circle support.

To record exact orofacial movements in a study, a 16 mm. Auricon camera directly in front of the patient is synchronized to the Milliken high-speed cineradiographic camera. Sound film records programmed instructions by investigators and the corresponding response of the patient. Electromyographic recordings are synchronized to frontal and cineradiographic cameras by a shutter pulse signal generated within the high-speed camera and transmitted to the multichannel oscillographic recorder. Therefore each frame of the motion picture films from both circle unit cameras can be positively related to each other and to the time base on the electromyographic tracings.

This system allows the patient to sit in a natural, comfortable position during the entire data recording session. This aids in the reduction of "operator-induced error," a part of the hithertofore difficult task of positioning the patient for temporomandibular joint studies. The new system also reduces the patient-induced error introduced into data recording when the patient attempts to hold the head in a tilted position for the duration of the study.—HARRISON M. BERRY, Jr., D.D.S., M.Sc., and F. ALLAN HOFMANN, *University of Pennsylvania School of Dental Medicine, Philadelphia. This invention was developed under Public Health Service grant No. DE-00240.*